



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JAN 22 1975

Picker Corporation
ATTN: Mr. J. B. Stickney
595 Miner Road
Cleveland, Ohio 44143

Gentlemen:

We have evaluated information contained in your September 3, 1974 letter concerning the Model 6376A(C/12) teletherapy unit and have determined that the device is acceptable for licensing purposes using sealed sources containing up to 13,680 Curies of cobalt-60.

Descriptive material should identify the unit in question as Model 6376A (C/12) and this model designation should be used as a reference by your customers in preparing license applications.

Sincerely,

Melvin W. Shupe
Materials Branch
Directorate of Licensing

7910110270
3PP

A label "Caution - Radioactive Material" (59) is fastened to the head with drive screws (60). A rating label (112) is also affixed to the head with screws (111). The calibration label (not shown) is similarly attached. Details of these labels are shown on the enclosed drawings A-T92-79, A-T92-176 and A-T92-78. The calibration label is changed at each source replacement, if the replacement is handled by Picker. Duplicate radiation warning labels and calibration labels are screw-fastened to the outside of the head shroud. The calibration label will be hand stamped with the identification of the isotope (cobalt-60), the amount of contained active material, and the date of measurement of the amount of contained radioactivity.

The words "Caution - Radioactive Shielding - Uranium" (not shown) are embossed in 1/2" high letters on the cast bronze shell, as a part of the casting process. The shutter wheel is engraved with the same legend on its outer surface.

B. Collimator

- (1) Drawing E183435 (sheets 1 and 2) show the beam defining collimator. An external view of the collimator, also showing some of the collimating vanes, is seen in the photograph on page 2 of Exhibit 1. The collimator consists of interleaved lead vanes faced with tungsten. The vanes are motor driven through a system of gears to change the field size. When the collimator vanes are opened, to achieve a large field size, the inner faces of the vanes describe a pyramid with its apex at the center of the front face of the source.

The distal vanes of the collimator are 45 cm from the source. The effective collimating length can be increased to 60 cm by attaching penumbra trimmers.

Above the moving vanes (nearer the source) is a primary beam definer made of lead with a pyramidal shaped hole through its center. The primary beam definer is item (2) on sheet 2 of the drawing. The entire collimator, including the primary beam definer, rotates about the collimator central axis, supported by the large diameter ball bearing.

The primary beam definer contains a lens package and mirror used to direct light from a projection lamp onto the patient's skin, to simulate the radiation field. The lens package installation requires a hole through the primary beam definer. To compensate for the loss of shielding, a tungsten block is embedded in the primary beam definer, above the hole.

- (2) Picker uses a similar collimator in an older machine, the Picker C/9, Catalog 6296F. This older collimator has already been reviewed and evaluated by the AEC. See, for example, Picker's letter dated October 6, 1972 and earlier correspondence such as AEC Isotopes Branch letter December 10, 1969, reference DML: 1B: FCD (S.S. Files 2).

The collimator used in the C/12 is identical with the older collimator with the following exceptions:

- (a) The shielding supplied by the primary beam definer is slightly thicker in the new collimator, and a tungsten block shields the lens package.
 - (b) Rotation of the collimator about the central ray axis has been motorized.
 - (c) The Zoneguard switches have been removed. In the older machine it was necessary to limit field size under some circumstances, because of the size of the beam interceptor. In the C/12, the beam interceptor is of larger diameter and the field size limitation is no longer needed.
 - (d) Field size indicator dials have been redesigned to conform to new appearance design requirements.
 - (e) Outer covers have been redesigned for appearance.
 - (f) The removable penumbra trimmers have been shortened, so that they extend to collimator length to 60 cm instead of the older 65 cm. (The older trimmer extension length sometimes causes mechanical interference problems). The thickness of the trimmers in the direction of the beam has also been increased by one centimeter. The combined effect has been to improve the penumbra trimming slightly.
 - (g) The distance localizer has been redesigned to improve its accuracy.
- (3) Because the new collimator is so similar to the old one, it is believed that no further details need be given.

C. Source capsule

- (1) Drawings (C 3800 H, et.al.) of the source capsule are enclosed. Note that one end of the outer receptacle is threaded. The source is screwed into the shutter wheel against a spring lock washer. Two small holes, (#10 drill) in the end of the receptacle, drawing C-40067, are engaged by a spanner wrench mechanism which is part of the source transfer cask, to screw the source into place. The details of the source transfer procedure are covered by data previously submitted in connection with license 34-7225-01.